

#SHOW YOUR ENERGY WITH S.T.E.A.M.

What is petroleum? How was it formed? How do you use petroleum? What's your favorite way to use petroleum? Where has petroleum and the energy from it made your life easier?

Oil and natural gas are a big part of North Dakota's economy, but did you know they're an even bigger part of your lives? Energy and the products produced from it are around you every day, from your cell phone to your bike tires. Responsible development of this resource requires knowing a lot about it and we want to see North Dakota students to show us your appreciation of energy by using your skills and knowledge in Science, Technology, Engineering, Art and Math to create a fun, informative video about our vast energy resources.

SHOW YOUR ENERGY - WHAT IT IS:

The Energy of North Dakota together with the North Dakota Governor's Office, the North Dakota Department of Mineral Resources Oil and Gas Division, and the Interstate Oil and Gas Compact Commission is sponsoring a friendly video competition for North Dakota students to show us their energy knowledge and know-how by producing a video that is three minutes or less. The campaign will include three grading rounds. The deadlines by which to submit videos are:

- Round 1: 5 p.m. Central on December 1, 2017
- Round 2: 5 p.m. Central on February 1, 2017
- Round 3: 5 p.m. Central on April 1, 2017

WHO CAN PARTICIPATE:

Any North Dakota school, classroom, and/or academic club is invited to participate. Video submissions will be divided into two categories:

- Grades 1-6
- Grades 7-12

Classrooms and/or schools are not limited in submissions, so if you have several great ideas, produce them all!

WHY YOU SHOULD SHOW US YOUR ENERGY:

This campaign is designed to fulfill several of North Dakota's educational standards (see examples here), making this campaign a great way for teachers to work fun, creative, hands-on activities into their regular lesson plans. And also because there are prizes.

One submission in each category (Grades 1-6 and Grades 7-12) will be chosen based on a grading rubric each round and will receive \$150. Each of these videos will continue on to the finals. One video from each category will be chosen for the Grand Prize of \$1,500 for the class, plus the chance to attend the Williston Basin Petroleum Conference in May 2018 to showcase their video.

HOW TO PARTICIPATE:

1. Divide students into groups (you may produce a video as a full classroom or club or divide the classroom or club into smaller groups).
2. Have students develop a video concept that demonstrates energy use and/or development and incorporates their knowledge, skills and/or usage of Science, Technology, Engineering, Art and Math.
3. Videos should be three minutes or less in length.
4. Grading of videos will be based on creativity, understanding of the topic, application of STEAM principles, and more.
5. Submit your video by the applicable dates listed above to: info@ShowYourEnergy.com.

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APPLICABLE EDUCATIONAL STANDARDS

This initiative is designed to include (though is not limited to) the following North Dakota Education Standards:

- 1.1.1 Identify models that represent real objects (e.g., globe represents the Earth);
- 1.1.2 Identify objects (e.g., toy vehicles, dolls) that are made of parts;
- 1.1.3 Describe different ways that things can change (e.g., size, mass, color, movement);
- 2.1.1 Explain ways models are like (e.g., globe and Earth are both round) and unlike (e.g., different sizes, missing details and functions) real things;
- 2.1.2 Identify some things that may not work if some of their parts are missing, broken, or assembled incorrectly (e.g., batteries are necessary for some toys to operate, wheels and energy are necessary for a car to function);
- 3.3.2 Explain how supply and demand affect personal economic choices (e.g., how scarcity forces people to decide which goods and services to obtain);
- 3.3.3 Explain the differences among natural and human resources, and how they are used locally;
- 3.6.1 Identify ways technology (e.g., zippers, Velcro, measuring instruments, computers) can be used to solve problems at home and school;
- 4.1.1 Explain changes in the real world using a model (e.g., rock formations of the Bakken)
- 4.3.2 Identify ways that natural resources (e.g., oil and natural gas) contribute to the economy and the local community and North Dakota;
- 4.3.4 Identify principal exports of North Dakota;
- 4.6.1 Evaluate the effects of technology on people and the environment (e.g., new construction, oil drilling, electric cars);
- 4.6.2 Explain how an invention may lead to other inventions;
- 5.1.1 Use an appropriate model (e.g., drawing, equation, computer program, diagram, or 3-D device) to convey scientific information
- 5.6.1 Use technology to design a solution to a problem;
- 6.3.1 Organize materials according to similar properties (e.g., physical, chemical);
- 6.3.2 Use simple machines to change forces;
- 6.3.3 Identify different forms of energy (e.g., chemical, mechanical, heat, sound);
- 6.3.4 Identify sources of energy;
- 6.3.5 Explain how vibrations create wavelike disturbances that spread out from the source (e.g., seismographs are used to measure vibrations and detect oil resources);
- 6.5.2 Explain how rocks are formed (e.g., melting, cooling, metamorphism, combinations of minerals)
- 6.5.3 Describe the characteristics of the layers of Earth;
- 7.5.3 Identify the Earth's renewable and nonrenewable resources;
- 7.5.7 Explain changes (e.g., the value placed on land, water, wind energy, and fossil fuels) that occur in the meaning, use, distribution, and importance of resources;
- 9-10.1.4 Describe the relationship between form and function (e.g., solids, liquids, gases, cell specialization, simple machines, and plate tectonics);
- 11-12.1.4 Explain the relationship between form and function (e.g., atoms and ions, enzymes, aerodynamics);

This is just a small example of the educational standards that can be applied to lessons on energy and oil and natural gas. The industry is complex, requiring skills and education in nearly every subject. If you have a question as to how these standards apply or if you have another idea and just need more information on how to incorporate energy, please let us know at info@ShowYourEnergy.com.

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VIDEO IDEAS:

Video concepts can be as simple or as complex as you like. Here are some examples your students may draw from to get you started:

- **Creating Energy:** How was petroleum formed? How is energy made? *Example:* Our oil resources were formed millions of years ago. Tell us the story explaining how pressure and heat helped form the Bakken.
- **Pulling Dragons from the Ground:** It's an industry slang term for recovering oil. Demonstrate how it is done and how STEM is used to do it. *Example:* Pumping units use a combination of gears to bring oil from two miles down. Just how do they do that?
- **Magic? Or Chemical Transfiguration?** How does a black liquid or invisible gas become the energy or many tangible products we use? How might life be different without it? *Example:* We all know Carson Wentz can channel a lot of his energy and strength to throw the ball a long way, but how does oil make it possible? Hint: it's in the football.
- **Mythbusters:** Take a common claim about our petroleum resources and see if you can prove – or disprove – it. *Example:* In the 1970s, everyone was convinced we were running out of oil, but now we have more than ever. How did technology change that belief. How has this been good for North Dakota?

Look on the back for links to other sites that help outline projects, experiments or activities to help students develop their video concept.

RESOURCES

Below are some ideas for activities and experiments that may help with concepts for your video:

U.S. Department of Energy Toolkit for Teachers and Parents:

<https://energy.gov/fe/about-us/students-and-teachers/study-guides-and-activities>

“Exploring Oil and Natural Gas,” National Energy Education Development Project

<http://www.need.org/files/curriculum/guides/ExploringOilandGas.pdf>

“Wonders of Oil and Gas,” National Energy Education Development Project

<http://www.need.org/files/curriculum/guides/WondersofOilandGas.pdf>

API Online Education Resources

<http://www.api.org/oil-and-natural-gas/consumer-information/in-the-classroom/online-education-resources>

“Force, Motion, Friction and Energy,” Baylor College in cooperation with HESS

<http://www.bioedonline.org/lessons-and-more/focus-on-stem/force-motion-friction-and-energy/>

The Switch Energy Project

<http://www.switchenergyproject.com/>

<http://www.switchenergyproject.com/education/energy-lab>

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